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DISEASES of the NERVOUS SYSTEM

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Use of Hypnosis in Neuro-Psychiatric Practice

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The physician in the practice of neurology and psychiatry is often confronted with diagnostic problems which are extremely challenging. Motor and sensory complaints or findings do not always conform to "known" anatomical structure. In other instances the patient may offer adequate psychogenic factors to explain otherwise well-delineated anatomical defects. When vasomotor, special sensory and gross personality functions are involved the problem becomes even more intricate. And when the well authenticated "neurotic individual" developes a true organic disorder the situation may become completely baffling.

It is the purpose of this communication to share a group of experiences culled from a selected series of cases in order to illustrate the use of hyponsis in diagnosis and treatment when such problems are presented.

Case 1. A white male of borderline intelligence, 22 years of age, working in a shipyard was struck over the dorsum of the left forearm by a falling pipe. The next day he complained of inability to use the left hand and presented a grossly typical wrist drop to support his complaint. Neurological examination disclosed a normal ability to extend the fingers and a normal associated extension of the wrist when he flexed his fingers. Sensory examination was negative and all radial nerve reflexes were normal. No amount of urging could induce the patient to extend the wrist.

Under hypnosis it was suggested that the "defective" muscle was regaining new strength, that he could extend the wrist, and that he would feel a "gradual increase in strength." Several such sessions restored full use of the hand.

Case 2. A white male, shipyard worker, 20 years of age, awoke one morning with complete inability to use the right arm. A painter by occupation, he was referred as a case of "possible lead poisoning." Examination disclosed no evidence of organic defect. With hypnotic suggestion not only did he freely move the arm but with questioning, he revealed the conflict which had engendered his difficulty: namely—his wish to leave his "essential war job" in Baltimore in order to return to his home in New York and his fear that such disengagement would subject him to draft call.

Often a "non-conforming" sensory defect is the presenting symptom. This may or may not be associated with motor disturbance.

Case 3. A white female 52 years of age developed pains in the right leg which were followed by the inability to walk or stand. Neurological examination showed indefinite sensory involvement and apparently intact motor mechanism as judged by reflexes and electrical reactions.

In response to hypnotic suggestion the patient was readily induced to stand and walk. After such a session comfort and relaxation could be maintained as long as the physician remained with the patient. When left to herself, however, marked pain and contraction would soon recur. She was examined by an orthopedist who, in spite of negative findings, suggested the application of a cast. At the end of three days there was no relief so the cast was removed.

For several weeks thereafter hypnotic suggestion alone was applied but no lasting improvement resulted. Thereafter, hypnotically-induced relaxation

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was followed each day by free-associational psychotherapy which within several weeks disclosed a tremendous fear that she was rapidly approaching the age of two older sibs both of whom had died at 54 years of age. She came to accept her illness as an attempt to enhance longevity thru an avoidance of all strain of living and at the same time to assure herself of a physician's constant attention. She has remained symptom-free since March 1936.

At times a patient presents a picture which, because it conforms to accepted organic syndromes, can only be truly evaluated after a painstaking search for psychogenic elements.

Case 4. A white female, 31 years old, married for 9 years, complained of excruciating pains in the left face, left side of the head, and teeth for a duration of 4 years; although she had experienced a fleeting similar attack when she was 17 years old. Its intermittent recurrence, lancinating sharpness and distribution lead to the impression of "trigeminal neuralgia" for which she was successively but unsuccessfully treated by an orthodontist (for malocclusion), an orthopedist (for jaw pain) and a rhinologist who removed her tonsils.

When she was first referred by her family physician (in July 1944), a neurological examination revealed rather marked sensitivity over the left supraorbital, infraorbital and mental foramina. Attempts at personality survey were thwarted, however, by an increasing tenseness which led to a "lump in the throat" which she then revealed had always preceded her head pains.

Hypnosis was, therefore, used in order to foster relaxation. When sufficiently relaxed she could speak freely and gradually disclosed a psychic conflict which resulted from her "love" attachment to one man and her moralistically engendered adherence to her husband whom she felt she had outgrown. With continuous psychotherapy she came to recognize her pains as somatic manifestations of frustration and latent hostility against her husband and father; became progressively less tense, chose finally to accept her husband and has remained symptom-free for the next two years.

The following two patients both presented the same complaint—namely, involuntary shaking of the head. Yet, in one the etiology was psychogenic and in the other it was organic.

Case 5. A white male 35 years of age when first seen complained of being run down, having lost weight and an uncontrollable shaking of the head. His case had previously been diagnosed as "spasmodic torticollis" for which he had been kept in a cast for three months by his physician in Ohio. Within 24 hours after removal of the cast his head shaking returned. His physician recommended reapplication of the cast but recalling the discomfort, he refused to accept this advice. Instead, he came to Baltimore and entered the Sinai Hospital. Here, his head which was constantly shaking, was observed to be tilted to the left but facing the right. Neurological examination was otherwise entirely negative.

Under hypnosis his head movements could be completely controlled. In the discussional psychotherapy he stated that he had "always wanted to be an obedient son" but that he had married at 20 years of age against his mother's advice. When his wife died 9 years later, he returned with his 4 small children to live with his mother, who frequently reminded him of her warnings against his marriage. For 5 years before his illness, he had worked in a mill but because he felt "there was no future in it," he frequently spoke of his desire to become a social service worker. His brothers and sisters taunted him about his "big ideas" so that gradually he found himself growing more and more tense in his surroundings. With further therapy he came to see that he had (as he put it) "wanted to do two opposite things at the same time," i.e. he wanted to remain the obedient son who was living up to his responsibility in his mother's home and at the same time he had a burning desire to break away from the situation. His frustration resulted in tension which in part spent itself in overcontraction and spasm of his neck muscles. He remained in Baltimore and, with a recognition of his limitations, satisfied himself with a job as an artisan at the Bethlehem Steel Corporation. Six months later he reported (over the telephone) that he felt entirely well.

Case 6. In contrast to the above, a white female, 49 years of age also complained of incessant shaking of the head which had turned to the left for about 10 months' duration. She had been widowed for the preceding 12 years but had been entirely well until 2 years prior to her visit when, following her son's departure for the army, she became "nervous." As time went on she noticed that with an increase of tenseness her head would shake. Finally the head shaking became constant so that even sleep was disturbed.

Hypnosis had no effect on the spasm although a month was spent in repeated trials. Likewise psychogenic material which could be related to her immediate difficulty was unobtainable. She was, therefore, referred to a neurosurgeon; underwent a modified Foerster operation—but developed pneumonia and died 4 days later.

The following case illustrates the added difficulties encountered when complicating vasomotor defects occur.

Case 7. The patient, a white female 38 years of age, complained of inability to move or feel with her left upper extremity. In addition she had numbness of the left face and neck. Her condition began some 10 months previously when her left

hand was struck by a revolving cup of a burr-lining machine, which she had been operating. Almost immediately after the blow she experienced a numbness of the lateral left hand and thumb. The whole hand soon became swollen and discolored and within a month the whole left upper extremity was useless. She underwent several operations for the purpose of exploring the nerves of her arm but experienced no improvement. As a matter of fact, the numbness spread in an ascending manner up the left arm, over the shoulder, chest and back areas. The skin became mottled.

Examination disclosed a limp left upper extremity with swollen, cold, clammy and cyanotic hand and fingers; complete motor and sensory paralysis over the left upper extremity; paralysis of the left shoulder and rhomboid muscles. The sensory deficit involved the more oral part of all three trigeminal areas and descended to the 5th thoracic level. Hearing was defective in the left ear and she lateralized to the right on the Weber Test.

From the diagnostic standpoint it was at first considered that an ascending peripheral neuropathy had reached the bulb (i.e. the brain stem) to produce the added sensory disturbance of the trunk and face in accordance with the dermatomic distribution described by Dejerine.[1] While such an organic possibility was remote, it was still considered plausible since the degree of vasomotor defect was so unusually striking. In addition the deep reflexes were hypoactive, her left sided hearing defect was of the organic type, and her response to vibratory testing over the bridge of the nose and chin was typically organic.

The patient was presented to a colleague (Dr. Israel Wechsler) who stated that he had seen a similar picture in a case of hysteria. Subsequent electrical studies and psychogalvanic tests yielded normal results. Under hypnosis it was amazing to see the patient move this limb which had been useless for almost a year. Gradually over a period of months with repeated hypnotic reenforcement the condition improved to a degree of practical normality.

Attempts at deeper psychotherapy, however, were fruitless because of the patient's moronic intelligence (I.Q. 66, Binet-Simon). As a matter of fact, any attempt to remold her personality structure was met with such resistance that for weeks she became less responsive as a hypnotic subject. One, therefore, had to content himself with symptomatic relief.

The difficulty encountered when the special senses are involved is exemplified in the following patient who first consulted a diagnostic clinic because of her deafness of 6 months' duration. Here she was found to have "combined air and bone conductive impairment. Adenoid tissue was seen encroaching around the eustachian tubes. Radon therapy was suggested . . . . Neurological consultation revealed no abnormalities. Hysteria was suggested. The psychiatrist's note stated that the patient has had nervous spells and that an electroencephalogram suggested possibility of epilepsy. The patient was put on luminal. The psychiatrist did not think hysteria likely."

Case 8. When first seen this 16 year old white female complained of complete deafness and "attacks" in which she would cry out for help. The first spell which was ushered in with marked crying had occurred 6 months prior to her first visit. This was soon followed by an urge "to say something nasty" and a hearing defect in the right ear. Hearing gradually decreased until 3 weeks before her visit when she "failed to hear anything from either ear." Communication was thereafter carried on either by writing messages to her or through her watching the lips of the speaker.

Neurological examination was entirely negative except for hearing tests which disclosed deficits in both air and bone conduction bilaterally.

Personality survey revealed the continued tendency since childhood to bite her nails and to wet the bed. As part of the examination of her intellectual endowment (but designed to test her lip reading) she was asked to spell such words as *good, spigot, traveler, proposition, behavior* and *preposition.* She spelled them all correctly. Her ability to distinguish between *proposition* and *preposition* from mere lip reading was entirely too good for one so recently deafened.

Hypnosis was therefore tried with the patient fixating her eyes on the physician's lips. The repeated suggestion was then made that as her eyelids closed the sound of the physician's voice would become more distinct.

The experiment was successful so that with continued treatment her hearing improved steadily. In the meantime through free association and discussion it was ascertained that just prior to the onset of her deafness, the patient, who had a reputation for being overly modest and proper, had been observed by a nurse living in the home, embracing a young man. The nurse told the patient what she had seen. The patient, however, denied the act. The nurse then added, "that's not like you—a nice quiet girl." During the ensuing days the patient was preoccupied with fears that she would be exposed by the nurse. And at the end of a week her deafness made its appearance. She broke off treatment after 8 weeks when her hearing had completely returned.

Hypnosis has also been found helpful as an adjunct in dealing with gross personality difficulties which are devoid of localized psychosomatic defects. It has thus been found useful to promote relaxation in the overly

tense (case 9, prior to an impending operation); to allay anxiety (case 10, in an acute grief reaction; case 11. in a difficult domestic situation); and especially to suggest sufficient relaxation in certain cases of insomnia (case 12. a medical student fearful of examinations; case 13, a druggist worried over failure in business; case 14, a grocery manager who became overly-anxious to please his employer; case 15, a liquor dealer who learned of his wife's infidelity).

In another instance (case 16) the difficulty involved a man 53 years of age who complained of insomnia and impotence for approximately 6 months duration when his "wife suffered a stroke." Although his wife rapidly improved, the patient's symptoms persisted. Further study revealed that the wife's stroke had occurred during coitus so that he felt himself responsible for her condition. So fearful did he become over his wife's welfare that any physical contact with her became intolerable. His remaining awake thus insured the avoidance of such contact. With hypnotic suggestion it became possible for him to remain relaxed in spite of added physical contact. In addition, however, discussional psychotherapy was employed in an attempt to relieve his feelings of guilt. Gradually, over a period of 2 months the patient made an excellent recovery.

The elicitation of psychogenic factors in evaluating a personality defect is at times aided by hypnosis especially when one is pressed for time in the search for such factors.

Case 17. A white female 33 years of age was arrested for forgery. It was learned that she had written checks payable to herself, forged her employer's signature, endorsed the checks, cashed them, and then gave the money to a man 10 years her junior. The offence which was repeated at weekly intervals extended over a period of a year and involved a total of some forty thousand dollars. The recipient of this money was a discharged army lieutenant who began receiving funds from the patient a year before her first offence by playing on her sympathy.

One day he attempted to become sexually intimate with her and was rebuffed. He remained away from her for some months thereafter but then called for her while he was in the hospital for an operation. She visited him and a friendly relationship was again established. On leaving the hospital he again called on her for financial assistance and gradually over the next few months induced her to give him more and more of her salary. During this period, however, his ingratiating behavior gradually took on a more domineering and threatening attitude so that without being aware of how the change came about the patient found herself impelled to do his bidding. One day, on learning that her employer was a very wealthy old man and that she had been writing out the checks which he signed, the young man suggested to the patient that she forge her employer's name. She refused. He displayed marked anger and, after the use of such implied threats as "you better had" proceeded to instruct her how to forge by tracing through tissue paper. She followed his instructions until she was apprehended.

On psychiatric examination she disclosed an overly dependent personality with much self-pity which was reflected in her inability to ever refuse a request for help from any panhandler or derelict. On the Rorschach study she revealed among other things a deep-rooted anxiety, marked overdependence and a sexual orientation suggesting the homosexual. She was hypnotized on a number of occasions during which it was suggested that she relive certain phases of her relationship with her partner in crime. It was during one of these sessions that she first spoke of having warded off the sexual approach of her partner and displayed a most remarkable degree of fears and agitation when it was suggested that this man was approaching.

In order to further study the dynamics of her delinquency, it was suggested, under hypnosis, that on leaving the office she steal the brass ash tray from the physician's desk. This suggestion was not carried out post hypnotically. Under subsequent hypnosis she recalled the previous suggestion that she steal and, in response to the question why she did not take the ash tray, she replied, "I never steal." It was then suggested (under hypnosis) that on arising she express her appreciation to the secretary and pat her on the cheek. On leaving the office this time, the patient expressed her appreciation as directed but failed to pat the secretary's cheek. This omission was considered as being possibly due to the patient's struggle against homosexual tendencies.

On the following day under hypnosis it was suggested that the patient's partner was approaching. She immediately became panicky and "hysterical" with fear. Never in her waking state did she display such overt affective manifestations. She was then told that her erstwhile partner was directing her to steal the physician's ashtray. She was then calmed and awakened. On leaving the office she took the ashtray with her.

That night she had a nightmare in which she dreamed of a visit by her partner who was directing her to steal. She jumped out of bed, ran to the

closet and, inserting her hand in her coatpocket, retrieved the ashtray which she returned the next day.

The patient was then hypnotized and was told that her boy friend was approaching. She again became panicky. She was then told that the partner had become completely bereft of all power; that he could no longer harm her. She immediately became calm. The direction to steal as coming from her former partner was again given—but this time it was not obeyed. She thus disclosed how much *fear* had played a motivating part in her delinquent behavior.

In an attempt to study the depth of changes in the emotional state wrought by hypnosis this same patient while under a state of hypnosis was directed to relive some pleasant experiences of the past. This she readily did, thus displaying cheerful talk, a smiling countenance and a completely carefree attitude. While in this state of apparent levity but still under hypnosis, the Rorschach Test was again administered. Interestingly, this test disclosed the same deep-rooted anxiety as did the test which was administered in the waking state. As a matter of fact, at one time she saw a "rat" to which she reacted with such exaggerated fearful affect that she almost awakened.

Case 18. This patient, a married woman, 23 years old, mother of a 22 month old child who was being raised by the patient's sister, complained of a continuous tired feeling in the left arm, numb sensations in the hand and intermittent twitching of this limb for some 6 weeks' duration. Two years ago she had had an attack of chorea in which the same arm had twitched.

Concerning her present illness she stated that her symptoms arose while she was arranging pads of butter in the restaurant in which she and her husband were working. She expressed fear that her old trouble (chorea) was returning and feared that she would have to quit her job. Because the neurological examination was negative and because she spoke of being jumpy and sleepless it was thought that some unrevealed psychogenic factors were playing a part in her illness. She was questioned under hypnosis and divulged that in January 1947 she found herself pregnant. Because her husband did not wish another child, and remembering his disabreeableness during her first pregnancy, she stated that she had gone to Ohio where a girl friend (whom we shall call) Lucy Brown took her to an abortionist. She expressed deep resentment against her husband whom in her waking state, she had praised. Before being awakened she was told to describe a picture (No. 1) of the Thematic Apperception Test, which she did. On being awakened she recalled nothing of what she had said under hypnosis and on being asked to describe the same TAT picture spoke of it as if she were seeing it for the first time.

The next day her husband was interviewed and he, too, seemed concerned that his wife's chorea was returning. He was then asked what of importance had occurred in January 1947. He then told of his wife's pregnancy and how she had learned from a loyal girl friend the name of an abortionist to whom she had gone for her abortion. The husband cautioned me against informing his wife that he had told me of this experience since she was deeply ashamed of it. On further questioning it turned out that the wife had one trusted friend in Ohio by the name of Sadie Brown (fictitious) and another loyal friend in Baltimore whose name was Lucy Cole (fictitious). It was interesting to see how the patient had spoken of "Lucy Brown" as a condensation of these two trusted friends. Furthermore, the local friend lived in a section of Baltimore bordering Canton. Thus the patient's actual visit to Canton (Baltimore) was displaced to (Canton) Ohio in her hypnotic productions.

The most perplexing problems are found to be related to the "known neurotics" who finally become afflicted with a true organic disease.

19. The following patient, a married woman 46 years old was referred because of "depressed feelings and inability to walk because of pain in the right groin and hip." She had been "high strung and nervous" since early childhood and had been diagnosed "psycho-neurotic" in a clinic of excellent standing 11 years before.

She managed to get along, however, until her present illness which began with a drawing sensation in her left leg 4 months prior to her first visit. She was successively seen by a dentist, an internist, roentgenologist, neurosurgeon and orthopedist who found her organically sound. An 11 day study at a diagnostic clinic also yielded the impression that "her difficulties lay on a psychiatric basis."

When first seen the patient cried a good bit—not because of pain but, as she stated "because of nervousness." Neurological examination was objectively negative except for her inability to walk due to a weight bearing defect of the left leg. Under hypnosis even this difficulty was distinctly improved. It was noted, however, that her temperature was 100° F. She was, therefore, put to bed, was given mild sedatives and a mixture to combat a recently-developed diarrhea. Hypnosis, discussional psychotherapy and encouragement were administered daily.

At the end of 15 days the patient wrote "after you left yesterday I was quite encouraged as I took a walk with the nurse and could walk pretty good just holding her hand instead of her arm. I was quite relaxed all afternoon and dozed most of the time. However, my leg hurts again now. I believe it is due to the fact that the quiet of the afternoon is over and my family talking and kidding in my room has upset me a little."

Success, however, was short-lived since a few days later her left leg was observed to become swollen. She was referred back to her physician

who had her admitted to the Sinai Hospital where x-ray examination revealed a neoplastic erosion of the left hip joint. She died 10 days later.

DISCUSSION

Like any phenomenon whose history is long, opinion concerning hypnosis has, and still is, varied. The ancients looked upon it as a miracle. Mesmer,[2] a physician, was considered a quack because of his interest in it. Charcot, however, about 1880, gave it serious consideration and perhaps for the first time through its use actually demonstrated the psychic influence on bodily functions.[3] Since then and despite many valuable studies, hypnosis even up to the present has attained but a questionable place in the therapeutic armamentarium of the neuropsychiatrist. Perhaps this is because too much has been expected from it.

After all, hypnosis is only an artificially induced state of hypersuggestibility which may, but need not necessarily, resemble sleep. It is obvious, therefore, that unless gains made during this "artificially induced state" are later integrated on the firmer basis of reality, one may find himself disappointed.

Whereas, hypnosis was originally used to "suggest away" symptoms, Breuer and Freud[5] first employed it to explore the *origin* of hysterical phenomena. Freud, however, because of its limitations as a method for prolonged exploration of the unconscious and because of personal difficulty soon gave it up as a means of investigation.

The experiences shared in this report however illustrate the service to which hypnosis can be put in properly selected cases. Like the reports of others who have used this method, it was found here, too, that a number of patients failed to respond. As a matter of fact, even in those responding one must ascertain that the depth of hypnosis is sufficient for the purpose desired. For example, one requires a greater depth for carrying out a Rorschach Test under hypnosis than for the promotion of simple relaxation in a mild anxiety state.

In this work the depth of hypnosis was judged by catatonia, yawning on suggestion, paralysis on suggestion, anesthesia, hallucinations and amnesia. All of these, of course, depend upon the degree to which the patient follows suggestions—or is willing to serve the physician. Ferenczi[6] has postulated that the hypnotic relationship is analogous to the "father-child" or "omnipotent parent-helpless infant" situation. Others of the Psychoanalytic School regard it as a relationship of unconscious love and surrender[7-10] or of regression.[9,11] White,[12] on the other hand, considers the phenomenon as a specific kind of interpersonal relationship in which the subject strives toward a direct goal as defined by the physician and as understood by the patient. The latter is an important concept since one can only work within the limits of the patient's conceptual orientation.

Regardless of theoretical considerations it seems from practical experience that the patient has to have confidence, must like the physician, and must wish to cooperate before good results can be obtained. While it may be true that anything that can be accomplished by hypnosis can be attained in the waking state[3,13] there is no gainsaying that, working within its limitations, hypnosis can serve a very useful purpose—yielding certain kinds of information much more rapidly than the classical analytical methods.[13,14]

In applying it to patients who present outspoken motor and sensory deficits it is imperative that the physician be well versed in the variations of normal central and peripheral neurological functions.

Although an observed paralysis or anesthesia can often be immediately cleared up under the hypnosis which had been merely used for diagnostic purposes it is best to suggest "gradual improvement" rather than to try too ambitiously for immediate suppression of symptoms. Such more gradual recovery spares the patient's self-esteem and at the same time offers a better opportunity to administer discussional or deeper psychotherapy between hypnotic sessions.

One need but reiterate that unrecognized organic disorders superimposed upon the neurotic personality present the most difficult problems. This is true not only because the one defect beclouds the other, but because such patients often respond favorably,

for a time at least, to hypnotherapy, thus postponing the true diagnosis and proper therapy.

In attempting to elicit psychogenic factors while the patient is in the hypnotic state one must be cautious not to take too literally the verbalized or acted-out productions of the patient. As observed in this study such material may be elicited in the form of displacements, condensations, or other distortions frequently resulting from the psychic economics of the dream state. For that reason material obtained from such patients must be evaluated as mere indications of etiology and trends rather than as true, i.e. undistorted, dynamics.

It is for this reason that hypnosis can not be considered a real cure. It is true that this method may bring about apparent recovery. And in a patient with subnormal intelligence who has managed to hobble thru life, this may represent the limit of achievement.

That changes in affect induced by hypnosis remain superficial is attested by the unaltered Rorschach pattern despite observed behavior to the contrary. For that reason, whenever it is possible, as judged by the continued cooperation and intellectual competence of the patient, deeper (analytical) psychotherapy should be instituted since only in this way can those fundamental personality changes be wrought which are so essential for a complete cure.

SUMMARY

In neuro-psychiatric practice the physician is frequently confronted with diagnostic problems which are extremely challenging. Not always do motor or sensory paralysis conform exactly with areas delimited by "known" anatomical structure. The patient may offer adequate psychogenic factors to explain other well delineated anatomical defects. When vasomotor, special sensory (e.g. auditory), and gross personality functions are involved the problem becomes even more intricate—only to become especially complicated in the "neurotic personality" afflicted with a true primary organic disorder.

A series of cases selected to illustrate the application of hypnosis in the diagnosis and treatment of such problems is presented.

It is concluded that hypnosis offers a most useful technique in the diagnosis of such cases. It also helps markedly in clearing up the presenting symptom-complex, and at times to elicit valuable psychogenic material. It fails, however, to strike at the basic personality structure of the individual so that unless deeper *analytical* psychotherapy is subsequently used the patient fails to gain that added insight which is the essential requisite for genuine recovery.

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Unsuccessful Suicidal Attempts*

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Whenever a suicidal attempt is successful the subsequent coroner's inquiry invariably ends in the laconic verdict, "death by suicide while temporarily insane." This psychiatric pronouncement is as pontifical as it is stereotyped. Implicit in this dictum is the assumption that the suicidal act stems directly from a mental aberration through which the deceased has just passed. Under the circumstances the coroner's verdict of temporary insanity remains unchallengeable. It is true that some appraisal of the ante-mortem situation can be had. An inventory of the deceased's last few days' activities as viewed by relatives, friends and fellow workers is usually recorded. At best such studies must be considered scientifically unacceptable and psychiatrically truncated.

However, there does remain for us a means of studying the mental status of suicidals and that is through the psychiatric examinations of those who have survived unsuccessful attempts. From the standpoint of the psycho-dynamics involved the successful and unsuccessful attempts can be regarded as essentially identical. For our purposes, the success or failure of the attempt may well be viewed as being highly fortuitous and relatively unimportant. Accepting this as our premise, we of this Psychiatric Institute have launched the project of studying 500 cases of unsuccessful attempts at suicide. These were cases referred to us by the judges of the Municipal Court over the period of 1937 to 1946. Supplementing this effort we have reserved 100 unselected cases for more detailed study.

For one thousand years now, civilized society has regarded suicide as anti-social. The offense is considered a double barrelled one as being directed both against the established state and established religion. From the standpoint of the criminal code suicidal attempts are catalogued as ephemeral offenses meriting only disorderly charges. Biologically the suicidal attempt represents a negation of the strongest human instinct, that of self preservation. Even if one elects to accept Freud's hypotheosis of the existence of a strong death instinct, one can safely assume that in the wholesome and well adjusted individual such an instinct is subservient to the will to live. The realization of this fact spurred the authors to a study of the problem and to the hope that as the deeper psychology came under investigation, some light might be thrown on the subject.

Our first consideration was an effort to explore the ratio of genuine to spurious attempts. There are certain methods of suicidal attempts which stamp them as being pseudo or fake attempts. Example of such are the grabbing and swallowing of ordinary household drugs as iodine and aspirin available and at hand. In contrast are the more serious attempts such as turning on the gas, attempts of jumping from dangerous heights or into hazardous depths of water (when unable to swim), slashing vulnerable parts of the body (wrists, throat or abdomen) and the taking of truly poisonous drugs.

Our study reveals (Figure 1) that in the age groups of under 20, the majority (52%) can be considered hysterical or fake attempts. Only 38% of these cases could have been successful. In the age groups of 20 to 30 years, 52% could have been successful. The percentage of cases that could have been successful increases with the age level so that in the group from 50 to 70 years, 99% attempts could be considered genuine and ominous. Half-hearted or simulated attempts were more often encountered in the immature individual whose age level was below 25. In the total group of 100 cases, 60%

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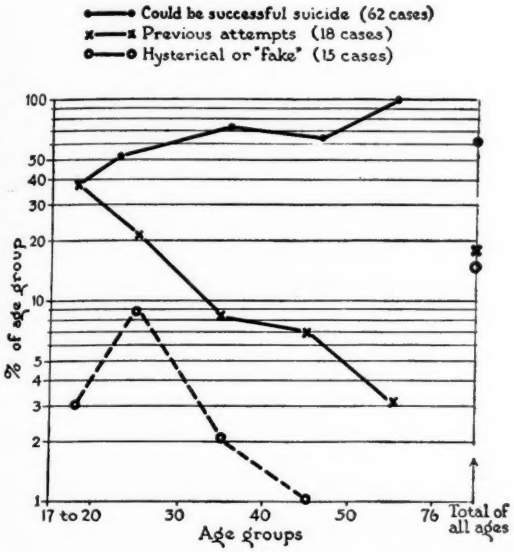
could have been considered genuine. In the breakdown of 15 hysterical cases, those who seem to want to broadcast their attempts, three were under 20, nine were between 20 and 30, two were between 30 and only one between 40 and 50.

FIGURE I



A study was made of a comparison between the number of cases referred to us for attempted suicide as against the total cases of the laboratory. The result can be found in Figure II. The lowest percentage was 1.1% to 1.25% between the years of 1938-1939. At the height of the war preparation years, 1939-1941, the percentage rose. It settled down somewhat in 1942-1943, only to rise in the latter war years, 1944-1945. The 1942-1943 country wide decline in suicide attempts has been corroborated by the decline in actual suicide deaths reported in the Metropolitan Life Insurance Bulletin for those years.[1] One can readily see that there was no steady increase as the war progressed, as there was in the total case load of the Institute covering the period 1940-1945. However, with the war's end near, the percentage rose. This correlates with the increase toward the end of the war in actual suicide deaths; the explanation of which remains a matter of conjecture.[2] That war in general decreases the incidents of suicide has been also shown in studies from England and Germany.[2,3] This is undoubtedly due to two factors. First, that during the war the individual becomes more highly integrated into the group. There is a tendency to better rationalize and sublimate one's own personal problems; secondly, that with economic prosperity, suicides decline.

FIGURE II

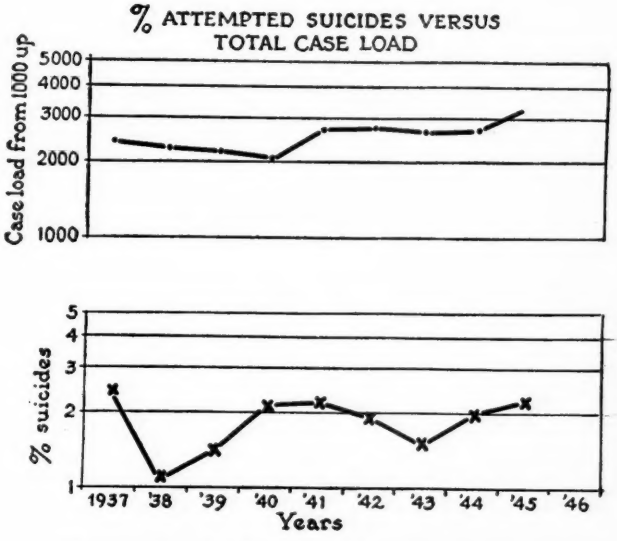
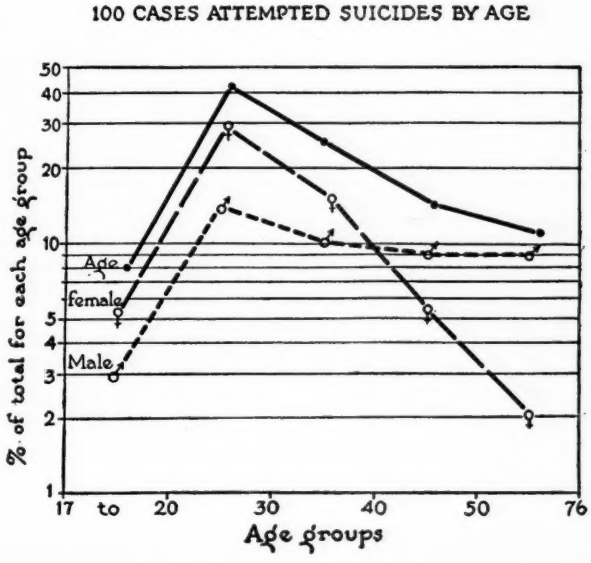


Figure III deals with the age groups distributions. The peak age group was from 20 to 30 years which follows age distribution of our total case load. In the younger age groups, females are greater in number. With the increase of age, the number of male suicides increases. This has been pointed out before and quite properly by L. Dublin.[4,5] In actual deaths the number of males dying for the same age group may be almost four times that of the female.

FIGURE III



That alcoholism in general is on the increase and that rapidly it is becoming a challenging social and psychiatric problem needs only to be mentioned. Acute alcoholism acts as a precipitating factor in these cases, but not as a causative agent. In Figure IV, it is seen that only in the age group below 20 is alcoholism a negligible etiology. In the other age groups it was a precipitating factor in between 40% and 50% of the cases. From this we can safely conclude that many suicidal attempts would never have been made if alcoholism did not enter into the picture.

The possession of intellectual endowment is no insurance against suicidal activity. A normal mental rating (I.Q.) is not a sufficient bulwark against suicidal urge. Because of their agitated mental states it was considered unwise to subject our patients to psychometric tests. Had we conducted such tests, the results would undoubtedly have been inaccurate. We did the next best thing, by substituting scholastic attainment for intellectual endowment as our yard stick. Of our patients 76% were above the 8th grade scholastically. Only 11% had less than 8th grade and only 2% were less than 4th grade. Table I carries with it a report of the educational levels of the City of Chicago for 1940. The distribution is very much like that of our suicidal cases.

TABLE I

CHICAGO POPULATION 25 YEARS OF AGE AND OVER BY YEARS OF SCHOOL COMPLETED: 1940

Total Persons 25 Years and Older	No. of Persons 2,146,006	% of Total 100.00	
Years of School Completed:			
None	88,744	4.1)	
1-4	160,019	7.5)	11.6
5-6	185,493	7.7)	
7-8	851,331	39.7)	47.4
9-11	327,206	15.1	
12	315,844	14.6	
College:			
1-3	108,723	5.1	
4 and more	98,901	4.5	
Not reported	9,765	0.5	

Source: U. S. Bureau of the Census

100 ATTEMPTS AT SUICIDE

Years of School Completed	% of Total
0-4	2.0
4-8	13.0
8	34.0
High School:	
1-2	21.0
4	28.0
College	2.0
Total	100.00

TABLE II

No Work	28%
Poor	9%
Irregular	4%
Moderate to Good	52%

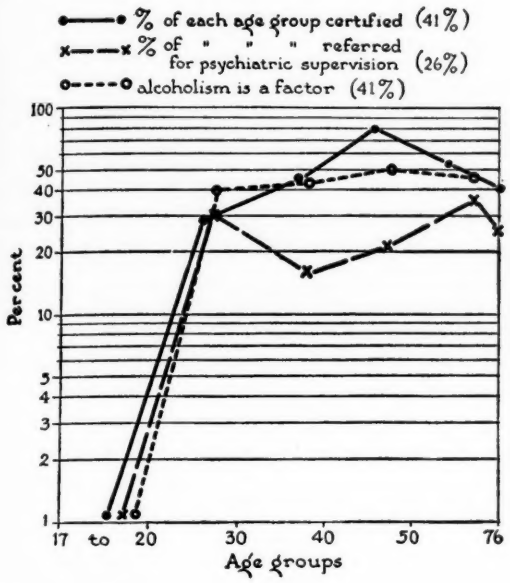
41% inadequate work recorded in a better than normal employment facilities.

Table II shows the work record of our patients. It must be remembered that our survey covered a better than average employment period. It is highly significant that more than 28% of the cases were unemployed, 14% were irregularly employed and in 9% the work record was very poor. Therefore, 41% could be considered as having inadequate work records. Lack of work or a poor occupational record is often a significant symptom of maladjustment and in the absence of bone fide physical handicaps, psychiatric reasons can be suspected.

It is of interest to note the wide and variegated diagnostic spread into which the patients attempting suicide fall, Table III. As is to be expected, the greatest cluster came under the category of reactive or situational depressions. Next come those under the diagnosis of alcoholism and then the

endogenous depression of the manic-depressive type. All of the classical psychiatric categories, however, enter to complete the picture.

FIGURE IV



Of the 100 cases studied intensively, 40 were certified to the Psychopathic Hospital as needing state hospital care (Figure IV), while an additional 26 were considered psychiatric problems of a severe enough degree to recommend both court and psychiatric supervision. The only age group which had a low certifiability were the group under 20. In the larger group of patients numbering 500 (Table III) 160 or 33.4% were certified to the Psychopathic Hospital. An additional 218 or 43.6% were considered active psychiatric problems; 385 or 77% of this total case load may therefore be considered as requiring active psychiatric care. The reason assigned by the patients for the suicidal attempts vary, from the trite to the bizarre. The greatest number complain of "sweetheart trouble." Frustrated lovers as a rule do not use effectual methods of suicide. (Table IV.)

TABLE III

PSYCHIATRIC CLASSIFICATION

	100 Cases	Total of 500
Immaturity	5	9
Psychoneuroses	13	25
Alcoholism		
Acute and Chronic	22	56
Chronic Alcoholism with Depression	0	10
Mental Depression (cyclothymic)	15	28
Reactive Depression	25	55
Hypomania	0	1
Catatonia	1	1
Schizophrenia	4	22
Paranoid State	6	6
Senility	1	17
Epilepsy with Deterioration	0	1
Organic Brain Disease (No nSpecific)	2	6
Paresis	1	1
Mental Deficiency	3	12
Psychopathic Personality	2	10
1943—1945	100	
1937—1945 out of 500 cases		258

168 of the 500 patients were certified to the Psychopatic Hospital.

TABLE IV

EVALUATION OF PATIENT'S EXPLANATION FOR SUICIDAL ATTEMPT

None Given	4
Alcohol	20
Neurotic Complaints	7
Sweeetheart Trouble	36
Shame	3
Exhibitionism	6
Epileptic Fugue	1
Family Discord	7
Impending Disaster	6
Poor Housing	1
Delusional	9
Just Depressed	1

DISCUSSION

As far as the individual is concerned a suicidal attempt represents a complicated personal reaction. Undoubtedly sociological and environmental factors are present and play an important role. That is, economic conditions, religion and social customs and traditions. The greater abnormalities of the material state, such as poverty and ill health must come in for proper consideration. After making allowance for the preceding factors, additional and often deep seated mechanisms of a psycho-pathological nature must be recognized as entering into the picture.

There is no one mechanism and no one cause. The individual's conscious explanations in the main appear trivial, superficial and misleading. In the dynamic psychology of Freud, the deep seated mechanisms of suicide fit in with ambivalent emotions. The ambivalency oscillated between affection and hostility. Self-accusation permeates the picture. A deep sense of guilt with an unques-

tionable penchant for punishment is in open evidence. The self destructive tendency is a part of the theoretical death instinct. This theory of guilt and punishment is often elicited in mental depressions. Universal as this mechanism is, it does not explain all of the cases. In some instances these reactions seem to represent a relapse into cultural patterns of the past. The conduct of primitive peoples should be studied if we are to better understand the suicidal act. Although suicide is a universal phenomenon, it has not been heard of in some areas of the world. According to Dublin,[6] such is the case on the islands of Tierra del Fuego of South America and the Andamen Islands and the Bay of Bengal near India.

It may or may not fit into the general cultural pattern of primitive life; varying from place to place. Some tribes approve, condemn, some consider it foolish, others attach a stigma to suicide. Where suicide is common, there are no penalties attached, some kill themselves at the slightest sign of danger, disappointment, or shame. In primitive communities in contrast to our complex society, more women commit suicide than men.

Some common motives in primitive peoples are as follows: An emotional feeling of shame. Germans, Scandinavians and Gauls regarded suicide as noble. Another common motive is revenge. In some tribes it is felt that the dead man's ghost will torment the survivor. This is a common motive in hysterical attempts, "You'll be sorry," hurled at the individual toward whom the attempt appears to be directed. In some tribes the persons involved are honor bound to follow suit, "Killing oneself upon the head of another," is the saying. This is the custom of the Tshi speaking people of the Gold Coast of Africa.

In societies where death is a life to come wherein activities of this life are believed to continue on, if a chief dies, the rest of the tribe attempts to follow suit (Indian tribes of Brazil). His many wives in their rivalry may hurry in competition to be the first to accompany him in the hereafter (Fiji Islanders).

In certain communities to escape mutilation or physical disability and dependence, aged members kill themselves. This also enables a better life for the younger survivors (Eskimos).

In some superstitions it is thought that the life ahead will be better than this one. A native in Melbourne expresses the idea in these words, "Black fellow tumble down, jump up white fellow with lots of sixpences."

Voluntary death is a regular custom among the Chukchee of Siberia. After deep sorrow, disease or death of some near relative, suicide is performed by stabbing, shooting or strangling. Their belief is that death by this means will lead to a better celestial abode than if death came naturally.

Among the Dobu of the South Pacific Islands, suicide is attempted after marital infelicity. Also after disappointment in love, etc. Here again women are more commonly the offenders.

Tender feelings may be another motive. Among the Hos, an Indian hill tribe where suicide is extremely prevalent, if the honor is offended such as when a girl marries against her will, or marries someone too old, or if a woman is unmarried and pregnant, she may commit suicide. (Somoyedes of Siberia, the Dakota and Omaha Indians and the Sioux Indians). The methods of suicide may vary according to the reason. The Trobriands jump off the top of a palm tree or take a fatal poison. Another less fatal poison which has an antidote, is taken in not too serious attempts like lovers' quarrels. The fatal forms are used in complex mental attitudes involving self punishment, revenge, rehabilitation (celestial?) and sentimental grievance (Malinowski).[5]

To understand these examples one must understand the pattern of life in the community. Where rugged individualism is the rule, there will be more suicides. In a well integrated (regimented?) society, suicide will be less common.

Malinowski felt there were usually two motives, "First, there is always a sin, crime or passionate outburst to expiate; secondly there is protest against those who have brought this trespass to light." As the victim commits suicide he announces how badly he has been treated and appeals to the sen-

timent of his friends or relatives for retaliation and if injured by an enemy, he appeals to his tribe for vengeance.

In general, at the present time, 100,000 attempts and 22,000 actual suicides are recorded annually in the U.S.[6] Out of every 1,000 infants born, 10 males and 3 females will eventually take their own lives (1930). The U.S. occupies a middle position in the world. The general rate is about 7 per 100,000. If the same rate prevailed there would be 310,000 suicides a year in the world. Austria, Czechoslovakia, Germany, Switzerland and Japan have highest rates. Ireland and Spain have the lowest. Few Negroes kill themselves (4.1 per 100,000). However, the rate for other ethnic groups is: Indians, 11, Chinese 55 and Japanese 27.

In relation to sex, more males succeed than females, but there are usually more attempts, hysterical and fake among females. There are more suicides in urban than rural communities.

As for religion, there are less among Catholics and Jews. This can perhaps be explained on the stronger integrations of these two faiths. The compactness of close family ties helps in the prevention of suicide.

There is less in the married than single, widowed or divorced. The latter has the highest rate.

And finally we are compelled to report that suicide as a cause of death provides a greater number than the sum due to typhoid fever, measles, scarlet fever, whooping cough, diphtheria and the enteritides combined!

SUMMARY AND CONCLUSION

1. An unsuccessful suicidal attempt is frequently a serious symptom of a personality disorder.
2. Although unsuccessful, 60% could have met with death.
3. Pseudo or "fake" atempts are more common in the immature age group under 30 years.
4. The war period decreased both the actual and attempted suicides.
5. Alcoholism is a precipitating or accelerating factor in over 40% of cases.
6. Suicides cannot be traced to lack of intelligence. The problem is definitely one of the emotions.
7. Inability to work not related to obvious physical cause is an important warning of a personality disorder that may lead to suicidal attempt.
8. Suicidal attempts, serious or otherwise, are indications of mental tension and are not to be taken lightly. Each case justifies further psychiatric exploration.
9. There is no direct relationship between the seriousness of the mental disorder and the method employed in the suicidal attempt.
10. Patients attempting suicide should be sent to secure hospitals rather than to jail cells.
11. The duty of the general practitioner towards a suicidal patient transcends the ordinary practice of giving first aid. Techniques aimed at life saving, such as stomach pumping, antidote giving, and suturing of inflicted wounds are only the rudiments of treatment.
12. It becomes the obligation of the attending physician to set the stage for a proper psychiatric follow-up study of each individual suicidal attempt.

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The Hyperventilation Syndrome*

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In the good old days before Will Hays cleaned up the movies, heaving of the chest was used to denote pain, rage, fear, love or any other emotion.

Hyperventilation is one of the commonest responses to a situation fraught with emotion. Time after time, while taking the history of a patient I have noted tension, fidgeting with the hands, twisting in the chair, and particularly the occasional deeper or sighing respiration. This last sign often gave the clue to many of the symptoms of which the patient complained. While there have been numerous studies on the hyperventilation syndrome, most of these have appeared in journals devoted to general medicine.[1,2] Psychiatrists except for Finesinger, Mandel Cohen and a few others have paid little attention to this important phenomenon. Neurophysiologists, however, have shown that many disturbances may result from blowing off of carbon dioxide, and of course the electroencephalographers make constant use of voluntary hyperventilation in bringing to light certain abnormalities n the tracng when the CO_2 tension in the blood falls below a certain level.

Hyperventilation was employed as long as twenty years ago in an effort to produce epileptic seizures, but it proved far more effective in inducing what were considered to be hysterical seizures with general stiffening out, tremors, tetany and *arc en cercle* of the French hypnotists. In this condition there is a general reduction in awareness, without actual loss of consciousness. Such reduction can be accomplished to the stage that pain is perceived much more distantly than in the normal state. Observations coming from "way back" on the flogging of sailors indicate that the subject would place a piece of lead between his jaws and breathe forcefully and rapidly as the flogging began. The unconsciousness that terminated the flogging was much more in the nature of a hyperventilation unconsciousness than that which could actually be attributed to the shock associated with pain.

Clinical hyperventilation syndromes come to physicians with a variety of phenomena, most of which are subjective. The commonest is a sensation of lightheadedness or giddiness, or dizziness or swimming in the head, which is seldom accompanied by staggering or incoordination. The next commonest sensation is tension in the muscles of the throat which may lead to a repeated swallowing for the purpose of overcoming it, but more frequently to sighing respiration. Patients complain of inability to take a satisfying breath, or the less observant ones may complain of shortness of breath, dyspnea, breathlessness, and demonstrate it repeatedly during the interview by more or less gasping respiration. Sometimes they are not conscious of this action until their attention is called to it.

Some reduction of consciousness is a not infrequent result. Patients complain that they can't concentrate, that they can't read or listen or follow a conversation. They have a feeling as if they were going around in a daze, as though they were about to faint. They have a far-away feeling and even feelings of unreality. Many of them complain of weakness, exhaustion, tiredness and they have been advised by their doctors to go to bed and stay there until benefit. The hyperventilation resumes whenever renewed demands are made upon the patient for physical or mental activity.

Muscular tensions are another prominent feature, both in the voluntary and in the involuntary groups. Tensions of the voluntary muscles appear as headache, due to contraction of the scalp muscles, to aching in the neck and back, to stiffness of the arms and fingers, to aching in the eyes and tightness in the throat. Rarely, but very characteristically, actual tetany may develop. The array of symptomatology that may be attributed to tension of the involuntary mus-

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cles is variegated and at times bewildering. They may include the vascular system with palpitation, throbbing, coldness and pallor and sweating of the hands and feet; the digestive system with difficulties and abnormal sensations running all the way from air-swallowing to alternating constipation and diarrhea, with plenty of disturbances in between. Disturbances in the respiratory and urogenital systems are occasionally met with.

It has often been said that the more complaints a patient has the better his chance of eventual survival. Not infrequently in confirmed and chronic hyperventilators there is fixation of complaints at the hypochondriacal level, and then the personification of each individual organ leads to a welter of symptomatology that defies all but the expert stenographer to keep up with. I recall one middle-aged lady who was able to follow the course of her food through each twisting and turning of the digestive tract. She was quite conscious of every sphincter along the course of her alimentary canal and gave vivid descriptions of the behavior of each one. Finally, in describing elimination she became almost poetic: "And Doctor," she said, opening and closing her hand as she spoke, "my rectum goes 'Puh, Puh, Puh.'"

Of course, not much can be done for these hypochondriacs whose symptoms have long gotten out of control. Watts and I have lobotomized a few and with good results, but it seems a rather drastic therapy except for the most malignant types.

CLINICAL TESTS

There are two tests that I consider of great value in anxiety states associated with hyperventilation. First is the determination of the pain threshold by the Libman test. This consists merely in pressure by the thumbs over the mastoid processes and then over the styloid processes. The normal patient feels only pressure when the mastoid processes are pressed upon, and a variable degree of pain when the thumbs are shifted to the styloid processes. The neurotic patient, however, is acutely sensitive to pain on pressure over the latter, and not infrequently finds mastoid pressure intolerable.

After as meticulous an examination as I think is warranted by the case, I apply the hyperventilation test in the standing position. I tell the patient that I have noticed his tendency to overbreathe, and that I believe many of the symptoms are due to the chemical changes brought about in the body by blowing off the carbon dioxide. My purpose in the hyperventilation is to demonstrate to the patient the genesis of his symptoms. With a stopwatch in my hand where the patient can see it, I exhort him to breathe deeply and rapidly for a minute. I tell the patient what to expect in order to have him under control so that anxiety will not prevent him from completing the test. As the test proceeds, I tell him at the 15 to 20 second period that lightheadedness is beginning, then at the 30 to 40 seconds that the far-away feeling is beginning, that the throat feels as if it were closing up, that the hands are getting cold. Some patients I urge to continue for a second minute if the respiratory exchange is insufficient. At the end of the period I ask the patient about the symptoms that he has brought out during the history-taking, and often find that a number of the symptoms are at least beginning to appear. When the period is ended I tell the patient to stop breathing. Rarely does he do so. He keeps on breathing, maybe not quite as actively, but, nevertheless, far more than would be warranted by his oxygen needs.

I explain to him briefly that the symptoms of which he complained have been brought on by the simple expedient of blowing off the carbon dioxide, and that they can be reduced by building up the level of carbon dioxide in the blood through muscular exercise. I then command him to do ten bending movements, and demonstrate to him how it is done, telling him to hold his breath while doing so. As he approaches ten I tell him to keep it up for another ten, exhorting him to hold his breath as he does so. At the end of this period he comes up finally with his face flushed and a little out of breath, but with the giddiness gone and the hands beginning to warm up. Sometimes in this test the hyperventilation gets beyond control and then runs away with a sobbing

spell that finally goes on to actual tetany. At other times the first experience of giddiness is sufficient to make an anxious patient beg to stop the experiment or actually to interrupt it. Sometimes after exercise the patient is exhausted and cannot pull himself together for several minutes. The controlled patient goes through both experiences without turning a hair. When the hyperventilation test is negative and the pain tolerance is high, I can exclude hyperventilation as a significant factor in the clinical picture. And usually such a patient is not suffering from an anxiety tension state but from some endogenous depression or organic disease.

In talking over the experience with the patient when the test has been concluded, I explain in as simple terms as possible the genesis of his symptoms. "You can see," I begin, "how blowing off the carbon dioxide from your system has brought out a lot of the symptoms of which you originally complained, and how building up the carbon dioxide levels, through exercise, has eliminated them. Those symptoms that you produced are due to muscular tensions that the result from lowering the carbon dioxide. It's like trying to run your motor on a lean gas mixture. When you overbreathe that way, you actually cut down on the amount of blood going to the brain and of course you feel as though you were going to faint. It's a real sensation, and it can be picked up by testing the brainwaves. The brain just doesn't function normally if it gets too lean a gas mixture. Then the nerves also don't get the proper mixture, and the muscles tighten up so that you get thesee feelings from your head and heart and stomach and so on. You can see how even the bloodvessels tighten up in your hands and make them cold and white."

I then explain to the patient how he may get the same sensations when he is unaware that he is overbreathing, that it may take him a couple of hours to accomplish the lowering of the CO_2 under ordinary circumstances, while he was doing it voluntarily within a minute in the examining room. I further explain that mental work leads to nervous tension that is met by needless increase in speed or depth of respiration, and as I watch the patient I call attention to the sighing respiration in such a way as to make the patient conscious that he is doing it under my observation.

Patients who are not interested in the discussion are usually poor candidates for reeducation. Many of them on the other hand will for the first time display some interest and ask me to go over the matter again. "There are two ways of overcoming this tendency to a lean gas mixture," I explain. "One is consciously to prevent yourself from overbreathing, and to build up the gas mixture until it is a rich one. The other way is to exercise your muscles to make up for the deficit. Both of them require a good deal of willpower. Let me see how good your willpower is."

This is a challenge to the patient, and many of them accept it. I take out my stopwatch again, tell the patient to take a deep breath and to hold it as long as he can. While the patient is holding his breath I further challenge the patient, saying that unless he shows good willpower there's not much that can be done for him, that holding the breath for one minute is par, that fifty seconds is fair, but that below forty seconds there is need for training. This makes a pretty good reference point as far as prognosis is concerned. Many patients give up after twenty or thirty seconds and are never heard from again. Those who carry out the full minute are then advised to practice in privacy, to determine how long they can make five individual breaths last. "Take a deep breath and hold it. Watch the second hand while it goes around the dial. As it reaches the minute mark let your breath out slowly, completely, grudgingly. Then take another and hold that the same way. See how long you can make those five breaths last. Par is five minutes. It's a matter of willpower. Don't let yourself get licked too easily. Practice it. There's no possible harm in this. You will notice that after this type of exercise you will feel a sense of relaxation; your hands will warm up. If you push yourself to the limit you will notice that your forehead has a little perspiration on it. Repeat these breath-holding exercises a dozen times a day, when you are at your

desk, or reading, or driving the car or riding the bus. You can do it unobtrusively and you will notice a definite change before your next visit."

Few patients will carry out this form of exercise. To them it seems foolish and they would rather take a pill or something. It may be stated that sedatives of all types reduce the tendency to overbreathe and are thereby effective in reducing the ill effects of hyperventilation. If anybody should develop a drug that will depress respiration without at the same time producing euphoria with its tendency to addiction, it would be a real boon to these people. Sedatives can be used in moderation, but opiates should be avoided.

Counteracting the effects of hyperventilation on the pH of the blood has been carried out particularly by ammonium chloride in the treatment of Meniere's disease. It is most effective in the functional cases. An acid forming diet, including some dilute hydrochloric acid counteracts to some extent the bad effects of hyperventilation.

For those who are amenable to psychotherapy, the reduction in the anxiety which underlies the hyperventilation is a choice method. Not infrequently the mere demonstration of the hyperventilation test is sufficient to relieve their fears of possible consequences as far as heart disease, insanity, brain tumor, etc., are concerned.

Patients who have a difficult situation to contend with are advised to undertake a program of physical activity. Again I try to use the simplest of terms: "If you can't overcome your tendency to overbreathe, then compensate for it by physical exercise, not the calisthenic kind, which is too boring, but some other kind which you can do. When your muscles are working your brain is resting. And when your muscles are working you will be supplying your brain with a rich gas mixture."

Most patients are advised to start walking five miles a day. They raise their eyebrows when this statement is made, so I challenge them again, telling them that the most important work they have to do is to get back to health and that even if they spend eight hours a day doing so they will only be keeping up the standard. If they return footsore, I advise other activities such as riding, skating, bowling, swimming, etc., in accordance with their preference. Progress is slow, with frequent setbacks, but persistence pays dividends in health and freedom from disagreeable sensations. Walking over the hills is the most satisfactory. There is something soothing in the rhythm of walking, and the long uphill pull brings perspiration to the forehead even on cold days. Perspiration of the forehead is a delicate indicator of high CO_2 tension.

Patients need encouragement first, last and all the time. They complain of exhaustion before they start and at the end of a block or two are quite worn out. I explain that this cannot be true fatigue, that it is nervous fatigue, a false fatigue, and that they should push themselves through this stage to their second wind. When they have gone far enough they will recognize genuine fatigue because at the end of their walk they will be relaxed in a pleasant tiredness instead of an unpleasant one associated with tension. It is gratifying to find how many people can pull themselves out of a rut in this fashion. Sometimes, if they are too conscious of themselves and too elementally fatigued it is desirable to start them on their career of outdoor activity with a few electroshock treatments, but with the understanding that the shock treatments are merely to get them started, that shock of itself can do no more good than a two mile walk, and that it leads to reliance upon the machine rather than the self.

Hyperventilation and anxiety are so closely related that it is impossible to treat one without the other. Not infrequently, however, the control of the effects of hyperventilation has a good effect upon the anxiety that is provoking the hyperventilation, and thus the vicious circle is broken.

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Psychogenic Factors in Parental Acceptance of Feebleminded Children*

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In 1942, at the annual meeting of the American Psychiatric Association, Dr. Leo Kanner presented a paper "The Exoneration of the Feebleminded" in which the accusation is made that "even some of our modern psychiatric clinics display a peculiarly haughty indifference toward the feebleminded". and that "These units, set up to serve their communities with regard to all their psychiatric problems, have in some places developed the habit of refusing to deal with the difficulties of the intellectually inadequate. The door is closed to a sizeable number of children because they are not suited to the particular variety of psychotherapy in which the clinic happens to specialize."

This, however, is not the case at The Guidance Center of the Bureau of Mental Hygiene of Houston. In 1946, out of 285 children seen at the clinic (not the total case load, but merely the first 285 children taken in chronological order) there were 58 children, 33 boys and 25 girls, between the ages of 1 and 17 who had I.Q's below 70. There were another 26 girls and 26 boys with I.Q.'s between 70 and 90. This latter group ranges between "Borderline Feeblemindedness" and "Dull Normal." This leaves 175 children, 112 boys and 63 girls, out of the 285, who had I.Q.'s above 90; that is, within the classification of "Average Intelligence" or above. To put it in terms of percentages, 21% of the first 285 children seen at the clinic in 1946 were definitely feebleminded. Another 18½% were between "Borderline Feeblemindedness" and "Dull Normal." Only 61.4% were of average intelligence or above.

It is not that The Guidance Center, which aspires to be primarily a treatment clinic, welcomes this 39.5% of children with below average intelligence. As a matter of fact, the majority of clinic hours, by far, were spent with the 61% of normally intelligent children. The clinic recognizes that, in rapidly growing Houston, sufficient facilities have not yet been developed to furnish an adequate diagnostic service for the community, which would allow a careful sorting of children to determine those who could be benefited by psychiatric treatment and those who could not. The clinic also recognizes that a simple diagnostic service for the feebleminded—the mere understanding of the condition and the admonition to the parents that the child should be placed in a special school—is not enough.

It accepts the obligation to try to interpret to the parent the full significance of mental retardation, what it means in terms of present conditions, future expectations, family and community relationships, the effect on other children in the family, the influence on the mentally retarded child itself, and most important, assisting in acceptance by the parent that the creation of a defective child need not be considered a badge of dishonor or failure. This last is not an easy job. It is fraught with many obstacles which oftentimes are so great that many general practitioners and pediatricians, even some psychiatrists, fear to tackle them. Knowing the terrific reaction of parents to the information that the offspring, in whom they placed such great hopes and the wish of fulfillment of their own unreached goals, will never be more than a dependent and helpless adult, incapable of anything constructive, most doctors avoid the storm by soft-pedaling the facts, creating false hopes that some day the child may approach normalcy and even possibly be able to achieve the parental standard. This only creates additional problems to the psychiatrist who has the best interests of the intellectually inadequate child at heart.

The greatest obstacle to parental acceptance of the feebleminded child is the psycho-

*Read at the meeting of the Houston-Galveston Neuropsychiatric Society, April 30, 1947.

logical threat to the parent. It is seldom, if ever, mentioned by the parent, but it may be stated as if he actually voiced it, "I have created something defective. I am a failure." This is an untenable conscious thought. Therefore, it is evident that parents will resort to all of the recognized mental mechanisms to avoid the bout with conscience which a frank recognition of the facts demands.

A commonly employed mechanism is that of projection. Hardly any history of a congenitally feebleminded child exists that does not contain the story of a fall on the head, severe trauma at birth, an accident, a severe illness, the possibility of glandular disturbance, anemia, generally run down condition, bad tonsils and adenoids—in fact, anything which will serve to take the intellectual inadequacy away from heredity or the parents' own responsibility for the condition. Unhappy marital conditions, with unsuccessful attempts at abortion are common and are responsible for much of the blame.

A pointed example is that of Mary W. who was seen and examined by the psychologist in February of 1944 when she was 5½ years old. The story was that Mary had been perfectly normal up to the time of her accident, three years before. The grandmother reported that previous to the "accident," which consisted of running through some live ashes where the city had been burning brush and where Mary burned the soles of her feet, "She was talking in sentences and seemed much more alert." Her psychometric examination with the Revised Stanford-Binet revealed that with her chronological age of 5 years and 7 months, she had a mental age of 2 years and 6 months, an I.Q. of 45. The family had brought suit against the city, claiming that her "accident" had caused the mental deficiency. The claim, of course, was disallowed for it was conclusively established that she was a congenital mental defective. She was advised not to enter kindergarten.

This, however, was not the end of the case. In March 1945, the kindergarten teacher at one of the schools called, saying that Mary W. was in her class. She was particularly interested in Mary because she seemed to be such a sweet child. In her interview with the social worker the teacher refused to accept the previous findings of the clinic, emphasized Mary W.'s "accident" and was quite incensed that the child should be branded as feebleminded. Despite this, she mentioned that Mary W. was helpless and had to be led around by the other children or the teacher. She also stated that Mary could not remember from one day to the next where to put her coat and belongings and that she did not appear to have very good motor coordination. The teacher was sure, however, that there were emotional problems which could be resolved through treatment at the clinic. Accordingly, the clinic agreeed to re-test Mary and in the second examination with the Revised Stanford-Binet, Form L, she obtained a mental age of 3 years which, with her chronological age of 6 years and 10 months, gave her an I.Q. of 44. It was only after several interviews with the school teacher that she was able to accept Mary's intellectual inadequacy, understand fully her obligation to the other normal children in her room and stand firm on a request that Mary be taken from kindergarten.

The grandmother, who has cared for Mary since her mother's death, was, at last reports (6-11-46) still clinging tenaciously to her projection that the "accident" caused Mary's condition—at the same time denying the permanency of the feeblemindedness, believing firmly that time, teaching, and God's help will eventually cure the child. She persists in trying to force the school system to accept Mary. According to the social worker's report, the grandmother practically "lives and breathes for the child." It is easily understandable that grandmother's "heart attacks" have increased in frequency under the strain of caring for Mary. Eventually, who knows but that her own health may become a convenient rationalization to allow her to "save face" when the point is reached where Mary can be sent to a training school for the mentally retarded?

Another device for protection against the guilt of having borne a defective child is seen in the soothing effect of falsification of memory. In the recent case of a 19-year-old

girl (I.Q., 56) the parents gave a normal developmental history. She sat up, walked, talked, cut her first teeth, and was toilet trained at a normal age. These parents were honest. They were not lying. However, it was only from other relatives who were around the child in her early years that the true history was elicited. This history showed marked delay in development in all spheres. The extreme desire on the part of the parents to have a normal child was so great that they actually believed she had developed normally and that some external circumstance or obscure physical illness was responsible for her inability to learn properly.

Frequently, we see the adoption of a martyr of chosen people complex on the part of parents of retarded children. Here the parent verbally accepts the mental deficiency, seldom hesitates to talk about it, but ascribes it to an act of God. Since it is God's will that the defective child has been placed with them, they feel that He has chosen them to do as much as possible for the child. Accordingly, an accusing sense of obligation is satisfied by extreme devotion and care heaped upon the defective child, quite often with sacrifices of advantages to normal brothers and sisters and other members of the family. This is even seen in adoptive parents.

Robert C., a four-months-old adopted infant, now showing signs of microcephaly and by repeated tests giving evidence of probable mental retardation, has been accepted by his adoptive parents as a challenge to their skill and capacity to mete out love and devotion. A change in the baby's behavior was noticed on his second visit to the clinic. At the time of his first testing, the parents had been told that *possibly* Robert might not develop entirely normally. Although the parents took this news with apparent calm and acceptance, there was considerable anxiety. When they returned with the baby a month later, he clung much closer to his mother and seemed to resent any disturbance by the examiner. On his first visit, Robert was happy, seemed to show interest in things around him, and to welcome the attentions of the psychologist. Since Robert's third visit to the clinic, in which there was still doubt as to his normal development, the parents told their pediatrician that regardless of whether the baby developed normally or not, they would keep it, since they were sure God wanted them to have this baby. They now welcome any hardship they might have to go through and are almost completely blind to any possible consequences that this retarded child will have at a later time on another adopted child, now three, who is brilliant. They are sure that "everything will work out all right."

Besides the natural guilt that arises with the creation of a defective child, there are several external factors which make the problem of acceptance of mental deficiency by parents difficult. One of these is the adverse dreaded opinion and comment of relatives and neighbors. Many times, this fear of opinion prevents the placement of the mentally defective child in an institution and the family goes through much unnecessary expense, pain and suffering. - Often, when the doctor thinks the parents have accepted institutionalization, he later learns that they have done nothing about it.

Vivien H., a 15-year-old spastic child (I.Q., 46) was seen at the clinic early in 1945. The mother came, asking for help in placing Vivien in the State School for Retarded Children because she was unable to care for Vivien and work, too. She stated that she had to go to work soon because of lack of finances. Arrangements were made with the probation office for the necessary commitment and Vivien was placed on the waiting list. The mother seemed extremely grateful. Nothing more was heard of the case until a pediatrician called the clinic, saying that she had seen the child and that the mother was at her wit's end because no school would accept Vivien. The probation department was contacted and it was discovered that on February 11, 1946, the State School had agreed to accept Vivien. The mother had refused to send her there because of the pressure of relatives and the promise that an uncle would make a home for the girl. Armed with this information, the pediatrician returned to see the child and suggested to the mother that she try

the State School. The mother then broke down and told the doctor the truth. Vivien has again been placed on the waiting list for the State School. Whether the mother will accept the opportunity when Vivien's turn comes around again depends on the strength that the doctor can give her to meet the adverse opinion of relatives and the public.

Another factor which makes it hard for parents to accept feeblemindedness is that it is often recognized late. Even in markedly retarded children, the differences between them and normal infants are not outstandingly noticeable in the first few years of life. In the "Dull Normal" and "Borderline Feebleminded" children, the parent has little opportunity to recognize anything wrong in the child until he starts school and there can be comparison with the accomplishments of other children. This late recognition of the condition tends to make acceptance more difficult because the parent believes that the pre-school years have been normal. Parents of such children are the ones who put extreme pressure on the child to achieve scholastically. They cause the teachers in the early elementary grades a great deal of difficulty.

With all of the factors that we have enumerated acting against an acceptance of mental deficiency, it can be seen that the doctor's job is a difficult one. In some cases, possibly nothing short of a period of heartache and suffering can bring the parents to the real acceptance of the condition and enable them to take action in the best interests of the child. One does not like to adopt an entirely fatalistic viewpoint, and it is undoubtedly the job of psychiatry to give continued thought and study to this much neglected subject.

Morphine Withdrawal in Addicts by the Method of Prolonged Sleep*

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Procedures generally employed for the withdrawal of morphine take the form of either immediate discontinuation of the drug, with or without substitution of opium, which is then in turn gradually withdrawn, or of a step-by-step decrease of the dosages of morphine and its complete withdrawal within a week or two.

Abrupt discontinuation of morphine is attended by atrocious suffering. Gradual withdrawal, although considerably less agonizing, still means a long, hard struggle for the patient and a struggle no less grim between patient and physician. To substitute opium seems illogical. Besides, opium is no easier to withdraw than morphine.

With Klaesi's introduction of prolonged sleep, recommended for treatment of schizophrenics but given up because of unsatisfactory results, a new method of withdrawal suggested itself. If it were possible, and harmless, to have the patient sleep through the period of acute withdrawal symptoms, the drug could be discontinued abruptly without causing the patient any suffering.

This method was first tried in 1924. Practiced since then in a great number of cases, it has proved its worth.

PROCEDURE

After the routine of admission, including careful physical examination, the patient is given an enema to avoid his being bothered by bowel movements during the first days of treatment and is then served a substantial meal. Prolonged sleep is started with an injection of hyoscin grs 1/50 and luminal grs V. No morphine is given after admission.

*The term "morphine" refers to opium as well as to morphine and their derivatives.

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During the first 24 hours the patient is medicated at least every three hours whether or not he is sleeping. Unless the drug level is built up gradually the patient on the second and third day will ned more frequent medication and higher dosages, and complications will ensue.

As long as the patient will swallow paraldehyde and keep it down, this drug, because of its lesser toxicity, is given alternately with sodium luminal. Later on the patient may be given paraldehyde 6 cc. i.m., but not oftener than two or three times a day because of its tendency to cause abscesses.

After the first 24 hours have elapsed, medication is given as needed in order to keep the patient drowsy. It is not necessary that he be sound asleep. The objective is to bring about amnesia for the period covering the acute withdrawal symptoms. To achieve it, the ideal condition would be continuous, sleeplike drowsiness.

The third and fourth day mark the height of the withdrawal symptoms. The patient will moan, show signs of great restlessness and thrash about violently even while sound asleep. During the fifth day he will quiet down, respiration will become even and regular and the patient will give the impression of someone sleeping comfortably. This stage marks the end of the acute withdrawal symptoms. From this point on sleeping drugs are discontinued during the day.

Gradually the patient will awaken. He will be atactic, unable to stand on his feet or even to sit up without help. He will have nystagmus and slurred speech but will probably be in a cheerful mood. Most patients pass through a stage of euphoria lasting a day or two.

After the acute symptoms have subsided, the second phase of withdrawal begins. It is characterized by poor sleep, an aching pain in the shins, and slight restlessness, particularly of the legs, the patient complaining that his legs are "jumpy." Warm baths of one-half to one hour duration and soaking of the shanks in a foot tub (a galvanized rubbish can serves the purpose) prove helpful. Other withdrawal symptoms —perspiration, diarrhea, sneezing and yawning spells—are rare. They are infrequent even in the first phase of the treatment, probably because of the effect of the barbiturates on the parasympathetic nervous system.

As long as sleep remains unsatisfactory, night medication is continued, preferably in the form of paraldehyde or chloral-hydrate, which are less habit-forming. No further medication is given by injection. The duration of this phase varies from a few days to a week, and even longer. When restlessness has subsided and there is no more discomfort from withdrawal, definitive psychotherapy is begun. It represents the third phase of the treatment and will have to be continued over a long period.

When the patient is ready for discharge from the hospital is impossible to predict. It depends on his personality, on the severity of the underlying neurosis and on environmental conditions. The patient should not leave the hospital until he feels physically well and sleeps without medication. Under most favorable circumstances, six to eight weeks' hospitalization is considered a minimum.

It is a good plan to have the patient return for a 24-hour quarantine every three months at first, and at longer intervals later. Under such a system he will refrain from relapsing into his old habit; or, even if he does slip, such a periodical check will make it possible to take care of him in the early stage of a relapse.

CARE OF PATIENT DURING PROLONGED SLEEP

1. As soon as the acute withdrawal symptoms begin, the patient thrashes about so violently that keeping him in bed is a constant struggle. If he is not restrained, he will fall out of bed and possibly injure himself. On the second day of treatment it is therefore advisable to place the patient on two mattresses on the floor where he can toss without having to be restrained.

2. In the intervals between medication, the patient is allowed to arouse sufficiently to use a chamber stool and to take fluids. He will do both without being fully awake. But even if he awakes briefly he will not remember what he did. Frequently the patient will

drop off again a few minutes after having evacuated or taken fluids. It is therefore advisable to wait 10 to 15 minutes before medicating him again, unless he is wide awake.

3. Fluids are forced to the extent of 2500-3000 cc. a day. This precaution will act as a brake on a rise in temperature. Should the patient refuse to drink, nasal tube feeding may become necessary. If he vomits, small quantities of fluids given frequently are tried. Atropine may also prove helpful. If vomiting becomes a problem, a single injection of morphine grs. 1/6 stops it immediately without prolonging the withdrawal symptoms.

4. Before each administration of sleeping medication, PTR are taken. If the temperature rises to 103° rectally or higher, sleeping drugs are discontinued until it drops to 101°.

5. Every morning and evening a sponge bath is given and the mouth washed with the help of a syringe, the patient lying face down.

ADVANTAGES OF THIS METHOD

1. It is quick-working.
2. It eliminates the severe discomfort associated with other methods.
3. It does not require the patient's cooperation and guarantees a smooth course of treatment.
4. It is unnecessary to examine the patient's belongings upon admission or to supervise his mail. It thus eliminates the patient's resentment against the physician's distrust. The searching of clothes and baggage can be undertaken unknown to the patient during the sleep treatment.
5. It eliminates the patient's constant nagging for "just one more" injection, a subject of continuous argument between patient and physician as well as his staff, preventing the good rapport, so important for gaining the patient's good will and for the success of further treatment. The sympathy and care given the atactic and helpless patient upon his awakening afford a means of establishing confidence in the physician's understanding and sincere desire to help.

COMPLICATIONS

Not infrequently, there occurs a rise in body temperature from the effect of the barbiturates on the temperature-regulating center. It happens usually if fluid intake is insufficient or if the drug is built up too rapidly. Seldom is it caused by a developing broncho-pneumonia. Ventilation of the lungs is ample because of the patient's thrashing about and resultant deep breathing during the acute withdrawal symptoms.

The only serious complication results from the depressive effect of barbiturates on the respiratory center. The danger of respiratory failure makes constant supervision imperative. If this supervision is provided for it is easy to counter this complication.

The following measures to prepare for this contingency have proved satisfactory: During treatment a tray with lobeline, metrazol and caffeine, as well as adequate syringes for i.v. injections, is kept close at hand. As soon as the symptoms of respiratory failure appear, lobeline is administered i.m. and mechanical stimuli started; if necessary, artificial respiration is applied until the physician arrives. A slow intravenous injection of 10-15 cc. metrazol prepared in the meantime will start normal respiration immediately. The swift response to the injection is dramatic to observe: while the needle is still in the vein, the patient will draw a deep breath and begin to open his eyes. This is the time to terminate the injection, which if necessary, may be repeated within 10 or 15 minutes. Frequently the patient will go right back to sleep. If he does not, sodium luminal grs iii or paraldehyde 4 cc. are given 15 minutes later to continue the sleep treatment.

The condition of respiratory failure is impressive but even before the introduction in 1932 of coramine and metrazol for complications arising during anesthesia, it always was possible to overcome the danger by the use of mechanical stimuli.

CONTRAINDICATIONS

Prolonged sleep is contraindicated in acute infectious diseases and in inflammatory conditions of the respiratory tract. Patients with chronic kidney trouble are not endangered.

Abrupt withdrawal of morphine in any form is dangerous in conditions characterized by decompensated heart.

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Changes in the Electroencephalogram in Subjects Under Hypnosis

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Electroencephalographic studies on a subject during hypnosis were made and reported by Loomis[1] and associates in 1936. They found that the electroencephalogram of a patient under what might be called standard conditions except for a hypnotic trance showed no fundamental change from the electroencephalogram taken during the so-called waking state. This was confirmed in a report by Dynes[2] in January 1947. Dynes emphasized that the tracings were practically identical during the waking state and hypnotic state and that such tracings were entirely different from those observed during physiological sleep.

We have attempted to study the electroencephalogram under standard conditions during the hypnotic trance and also while various suggestions and certain afferent stimuli are applied during the trance. A six-channel electroencephalograph recording simultaneously from frontal, parietal and occopital leads was used. Eight subjects were included in the study. Each had been hypnotized repeatedly so that the trance was rather easily induced. Also each subject had had at least one tracing made in the laboratory before hypnosis was used on the subject while in the laboratory. For purposes of reporting, the subjects are divided into four groups as follows: 1. Patient with diagnosis of Anxiety Hysteria, showing tension and muscular ties. 2. Patients with diagnoses of Anxiety States, showing in the waking state tracings characterized by low amplitude high frequency waves with very poor, infrequent trains of alpha activity. 3. Subjects showing normal tracings and excellent alpha activity. 4. Patients with previous craniotomies.

The first group included only one patient, who was diagnosed "Psychoneurosis, Anxiety Hysteria" and clinically he was noted to be extremely tense and to have what were thought to be functional tics of muscles of the face and head. Electroencephalographic tracings made during the waking state were entirely unreadable due chiefly to interference by muscle potentials. All attempts to persuade the patient to relax failed. The patient was hypnotized and was told repeatedly that he was completely relaxed. Observation at this time showed the patient to be relaxed and have no tics. During this period the tracing, readable and entirely normal, showed a good 10 per second alpha rhythm. While still in the hypnotic trance and through suggestions of tension alternating with suggestion of relaxation, the record would change from a poor one with no discernible alpha activity to a good record with good alpha activity.

The second group, consisting of two patients with diagnoses of Anxiety States

showed waking state tracings characterized by low amplitude high frequency waves with very poor infrequent trains of alpha activity. There was little, if any, change in the tracings when the patients were told to relax in the waking state, but under hypnosis and with suggestions that the subject was completely at ease and relaxed, a relatively excellent alpha pattern was observed. One of these patients through hypnotic suggestion was regressed in age one year to a very embarrassing and emotionally tinged episode in his life. While in this state the tracing from the subject was very similar to his waking state tracing but no alpha activity was observed. When he was again, through hypnosis, returned to the present and made to feel completely at ease and relaxed there was a return of the relatively excellent alpha pattern.

These two patients seem to correspond to the group of patients with Anxiety States reported by Cohn.[3] He noted that a certain group of patients showed electroencephalograms "marked by a diminished alpha frequency potential output. All regions of the head recorded from showed a low amplitude, random high frequency oscillation. Usually within 20 seconds after the onset of deep breathing a relatively excellent alpha pattern was observed." Cohn believed that the increased alpha wave output was the result of the distraction of the patients' attention from themselves. In 1938 Franks[4] reported a case which is comparable to ours. His patient showed 10 to 20 percent alpha activity before and after a self-induced trance and 100 percent alpha activity during the self-induced trance. This phenomenon could be repeated and there was no increase in alpha output when the patient tried to relax while not in a trance.

Our third group of subjects consisted of two patients with diagnosis of Psychoneurosis, Anxiety State and one normal subject, a hospital attendant. Their waking state encephalograms showed excellent alpha rhythm and were otherwise normal. During the hypnotic trance there were no fundamental changes in the tracings regardless of whether the suggestion was that the individual was tense or completely relaxed. Hypnotic blindness was induced in all three of the subjects, and when their eyes were opened in the semi-darkened room the alpha waves disappeared on every occasion and in all subjects. In one of the subjects short trains of low amplitude alpha waves appeared after approximately one-half minute even with the eyes open. While the subjects were still hypnotically blind and not conscious of any sensation, a pencil beam of light of moderate intensity was flashed on the closed eyelid. The alpha activity in each subject again disappeared. A similar disappearance and reappearance of alpha activity was observed in the waking state as in the hypnotic state where the same procedures were applied.

Findings in the last three cases seem to correspond to those reported by Lundholm and Löwenbeck[5] who were convinced "that the cortical electro-activity is not affected by hypnotic modification of seeing." An article by Lemere supports such conclusions. The alpha rhythm was abolished in several hysterically blind persons whom he examined when a light was flashed on the retina. Our results were not in harmony with those of Loomis and associates who studied the alpha rhythm of their patient during periods of hypnotically induced blindness. While the patients' eyelids were kept open with adhesive tape "trains appeared when the suggestion was made that he was blind, and in every case they ceased when the suggestion was made that he could see. This was true both when there was a light in the room and when the room was in total darkness."

Our last group consisted of two patients who had craniotomies at an earlier period. The first patient had a colloid cyst removed from the floor of the third ventricle in January 1943. Prior to the operation his findings indicated increased intracranial pressure and he showed a right homonymous hemianopsia. No electroencephalogram had been recorded. After the operation his vision gradually returned to normal. During the first part of 1947 repeated electroencephalograms were normal. Under hypnosis the patient was regressed in time to a period shortly before the operation. He complained

of headache and showed a right homonymous hemianopsia. An electroencephalographic tracing taken while the subject was so regressed was normal and showed no changes from his waking state tracing. The second patient, age 25, had a history of a head injury at the age of 16 months followed by frequent grand mal seizures. In May 1945 an electroencephalogram was characterized by slow 4 to 6 cycle per second waves with occasional random spikes which focalized in the right frontal area. The patient had a craniotomy in June 1946 in which the neurosurgeon performed "a resection of a porencephalic cyst of the right frontal lobe." Since the operation he has had four grand mal convulsions. Electroencephalographic tracings taken since the operation have been normal on two occasions and on two other occasions the tracings have shown infrequent generalized bursts of slow 5 to 7 cycle per second waves which were interpreted as mild paroxysmal cerebral dysrhythmia with no localization. In September 1947 the patient was hypnotized and regressed to May 1945. Electroencephalographic tracings taken while he was so regressed showed a mild cerebral dysrhythmia with no focalization and were essentially the same as those taken during the waking state.

In conclusion it is suggested that:

1. Hypnosis can be useful in obtaining good electroencephalographic tracings in some individuals where muscle potentials and tension interfere with the obtaining of a good readable record.
2. The electroencephalogram taken during the hypnotic state but otherwise under standard conditions is apt to show no fundamental change from that taken in the waking state.
3. Hypnotic modification of seeing does not change the electrocortical activity.
4. Hypnosis, per se, does not affect the cortico electrical physiology as recorded by the electroencephalograph but changes in the emotional state of some subjects through hypnosis can modify the electrical activity.

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Neurological Clinical Pathological Conference

of the

Cincinnati General Hospital

CHARLES D. ARING, M.D., EDITOR

Case No. 228544,

PRESENTATION

A 58 year old negro porter was brought to the hospital on August 10 complaining of weakness and numbness of the lower extremities. Arriving at work as usual at 7:30 A. M. of August 7, he first noticed weakness of his knees. With the passage of time he had increasing difficulty controlling his legs. By 10 A. M. he was unable to walk without aid, thus being forced to return to his home where he took to bed. A few hours later his ankles and feet were swollen, he developed tingling sensations and a feeling of numbness in the feet and he was unable to evacuate his bladder. By evening he was barely able to "wriggle" his toes and his legs were completely numb. On the following morning (August 8) his lower extremities were completely paralyzed. He had neither urinated nor defecated since the onset of the illness.

The past history did not contribute to an understanding of the presenting illness. His health had always been excellent and he had had no recent illness or injuries.

On examination (August 10) the patient was alert and cooperative. The heart was slightly enlarged to the left, the bladder distended to the

level of the umbilicus, the anal sphincter was relaxed and there was pitting edema of both ankles The neurological abnormalities were limited to the lower trunk and extremities and consisted of flaccid paralysis of both lower extremities, loss of all sensation below the level of the 11th thoracic dermatome with hypalgesia and hypesthesia extending one segment higher; the deep reflexes were not obtainable in the legs. There was no response to plantar stimulation. The upper abdominal skin reflexes were present whereas the lowers were absent. The umbilicus deviated toward the xyphoid with active flexion of the neck.

Throughout his hospital course of 40 days the neurological examination was repeated frequently and the findings remained unchanged. Despite the usual precautions decubitus ulceration developed in the heels, buttocks and sacral areas, progressing rapidly as did also an urinary tract infection. He lost weight, became increasingly lethargic, developed yellow discoloration of the sclerae, finally became irrational and expired on Sept. 18.

On admission the temperature was 100 degrees F, the pulse rate 86, respiratory rate 20, and the blood pressure 170-180/100. He developed a daily elevation of temperature between 101 degrees F to 102.6 degreees F. The pulse rate gradually rose to about 100. The blood pressure was recorded at 140|90 on August 15 and 115|60 on September 1.

Laboratory data: At the time of admission to the hospital, blood counts, hemoglobin determination and sereological reactions of the blood were normal. With the progress of infection the white blood count elevated and on September 18 reached a high of 29,000.

Originally the urinalysis was normal, but the urine soon became loaded with pus cells and urine cultures revealed B. coli communis, aerobacter aerogenes and nonhemolytic staphlococcus aureus

The blood urea nitrogen rose from 21 mg. % on August 13 to 115 mg. % on September 17. Late in the illness the liver funuction tests were normal except that the alkaline phosphotase was 2.2 units, the serum bilirubin 7.3 mg. %, and the icteric index 32.

Roentgen studies revealed a slight enlargement of the heart and minimal calcification of the left pleura. The dorsal, lumbar and sacral vertebrae were normal. Electrocardiogram revealed PR .16, QRS .07 notching of P 1, 2, 3 and isoelectric T 1, 2, 3.

Cerebrospinal fluid:

Date	Initial Pressure mm. H_2O	Lymphocytes per cmm.	Protein mg. %	Chloride mg. %
8/10	145	0	31	708
8/15	150	2	88	
8/22	120	0	55	684
8/25	145	17	54	
9/8	85	2	54	

The cerebrospinal fluid Wassermann and colloidal gold curve were normal; the dynamics were always normal. On August 25 the cerebrospinal fluid dynamics were tested quantitatively, with the blood pressure cuff around the neck to deliver the pressure.

DIFFERENTIAL DIAGNOSIS

Dr. Harry M. Salzer: This patient had the sudden onset of paraplegia associated with edema of the feet and ankles. A few hours later he took to bed. The history was typical of an acute transverse cord lesion beginning on August 7. For the benefit of the students, I wish to say that an acute transverse lesion of the spinal cord constitutes an emergency. You should realize that it requires immedate treatment, otherwise bladder and skin complications soon develop. The patient with an acute transverse cord lesion may require a prompt laminectomy, but in this particular case nothing helpful could have been accomplished surgically.

The findings on examination left no doubt as to the localization; it was at the level of D-10. All sensation was lost; the upper abdominal skin reflexes were present but the lower were absent. Throughout the course of his illness the clinical findings remained unchanged, the patient being in a state of spinal shock all the while with deep reflexes unobtainable. The rapid development of bladder and skin infection was felt to be a factor in the maintenance of this state of spinal shock.

During the latter course of his illness, there was yellowish discoloration of the sclera which was felt to have resulted from toxic hepatitis in association with the bladder and skin infection or possibly caused by metastases to the liver. The blood pressure was elevated from the beginning suggesting the presence of vascular disease, particularly so because in association with acute spinal shock, there is usually a fall in blood pressure.

The cerebrospinal fluid studies were never helpful except to rule out a complete block. One wonders if roentgen study with pantopaque shouldn't have been done.

As to the course of this transverse lesion, an extrameduallary-intradural or extradural tumor of the usual type may be excluded because there was no block . Something happened acutely to the spinal cord circulation

to bring on paralysis. It may have been some type of myelitis. Myelitis is not a happy term inasmuch as it is used to denote many types of transverse cord lesions; with Kinnier Wilson we believe the word "stands in need of being pruned." Acute myelitis should connote inflammation yet it is employed for lesions such as thrombosis.

Myelitis occurs on an infectious, chemical, or toxi-degenerative basis. The infectious causes range from a to z, from anthrax to zoster with malaria in the middle. A tuberculoma in the cord would be considered unlikely as would a gumma. There is no reason to consider a chemical myelitis in this case inasmuch as the patient had not received spinal anesthesia, arsenicals, or serum. There was also no reason to suspect a toxi-degenerative type of myelitis such as one might find associated with pellagra, pernicious anemia, leukemia, or porphyria.

Infections outside the spinal cord such as a paravertebral, tuberculous abscess or epidural abscess with secondary vascular occlusion would also be considered unlikely on account of the rapid onset, low cell count, and insufficient elevation of the cerebrospinal fluid protein.

I feel that this lesion was too rapid to be anything other than vascular occlusion of the spinal arteries and veins with softening of the cord, in other words myelomalacia (or thrombomyelia). Myelomalacia occurs as the result of arteriosclerosis with atheromatus plaques, syphilitic arteritis, haemic states, cardiac asthemia with low blood pressure and impoverished circulation, trauma, and interference with blood supply as the result of tumor or abscess. My diagnosis is myelomalacia which I envision as caused by a malignant tumor shutting off the circulation to the spinal cord via radicular arteries at the level of D-10. Such lesions may not be associated with spinal block. Other possibilities, however, are legion, and any one of the several disorders mentioned above could furnish the answer.

DISCUSSION OF PATHOLOGY

Dr. I. Mark Scheinker: The gross appearance of the brain was essentially normal. The major blood vessels were thin-walled and of normal distribution. The gross examination of the spinal cord revealed a large area of brownish discoloration, extending from the mid-thoracic region to the cauda. On transverse section, the mid-thoracic region of the cord displayed far advanced softening. The softened areas of the cord were of a brownish color and extended through the major part of the cross section; only a small segment of the cord periphery remained intact grossly. Section through the lumbo-sacral region of the cord showed a sharply demarcated area of destruction confined to the dorsal columns.

Microscopically the lower dorsal segments of the cord revealed the presence of a small number of abnormal vascular channels characteristic of an angiomatous malformation. Some of these extremely distended blood vessels were surrounded by large accumulations of macrophages packed with blood pigment.

Sections taken from various levels of the spinal cord below and above the angiomatous malformation, revealed widespread areas of softening extending throughout the major part of the cross-section of the cord. In some areas the cord displayed a sponge-like appearance with formation of a large number of vacuoles harboring gitter cells. Section taken from the cervical spinal cord, medulla, midbrain and from both hemispheres failed to reveal any abnormality.

Clinical Diagnosis,

Transverse myelitis, D-11 on the basis of thrombosis of anterior spinal artery.

Dr. Salzer's Diagnosis,

Myelomalacia.

Anatomical Diagnosis.

Angioma of the thoracic spinal cord with hematomyelia.

Acute pyelonephritis, gangrenous cystitis, toxic myocarditis, hepatosis and pleuritis, and extensive fibrous pleuritis secondary to spinal cord disease.

Editor's note: These conferences are conducted under the direction of Charles D. Aring, M.D., Professor of Neurology, assisted by I. Mark Scheinker, M.D., Assistant Professor of Neuropathology, and Howard Krouse, Assistant in Neurology, University of Cincinnati College of Medicine.